

Building Technologies Program

U.S. DEPARTMENT OF  
**ENERGY**

Energy Efficiency &  
Renewable Energy



## **Residential Building Energy Codes - IECC 2012 and Beyond**

**Welcome to the Webinar! We will start at 12:00 Noon Eastern Standard Time**

**Be sure that you are also dialed into the telephone conference call:**

**Dial-in number: 888-394-4822 ; Pass code: 7170033**

**(If asked for a PIN #, press \*0)**

**Download the presentation at <http://www.buildings.energy.gov/webinars.html>**

**There will be a Q&A session at the end. Questions will be submitted electronically and answered verbally. Submit your questions by selecting "Q&A" on the menu at the top, click in the top box, type your question and click "Ask."**

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- Two major code development goals:
  - Improve the 2012 IECC by 30% relative to the 2006 edition
  - Improve the 2015 IECC by 50% relative to the 2006 edition
- One major code implementation goal:
  - Assist states in achieving and documenting 90% compliance with the 2009 IECC by 2017
- One major new direction:
  - Existing buildings

# Changes to code format

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- It is not clear that 50% improvement can be achieved prescriptively

Zone	Ceiling R	Wall R	Floor R	Glazing U
1	30/49	13/22	13/36	1.20/0.25
2	30/60	13/30	13/49	0.75/0.15
3	30/99 (!!)	13/36 (!!)	13/60 (1 quit)	0.65/0.05

...

Current 6

49/?

19/?

30/?

0.35/?

- It is not clear that 50% improvement can be achieved prescriptively
- Several new approaches have been discussed
  - Prescriptive baseline with a performance requirement of X% better (“prescriptive plus”)
  - Annual performance budget (Btu/ft<sup>2</sup>)
  - Annual performance budget (Btu...size matters)
  - Annual Carbon budget
  - Any of the above with post-occupancy metering
  - Required renewables (i.e., regardless of performance budgets, cost effectiveness, etc.)
  - Capacity constraints

## Issue: Changes to Code Format, cont'd.

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- Capacity constraints
- What are they?
  - Most code provisions are designed to limit the amount of energy consumed by a house
  - Energy constraints are often difficult to enforce
    - Prescriptive requirements are dependent on proper installation and quality control (official lacks time/expertise, builder may not care)
    - Prescriptive requirements don't encourage integrated design
    - Btu/carbon budgets are all about simulation/calculation/rules (i.e., you're actually regulating a large suite of surrogates for Btus)
    - Post-occupancy metering doesn't fit the enforcement paradigm
  - Capacity constraints may solve some of those problems
  - Idea: limit key capacities rather than consumption

- **Capacity constraints—an example**
- **Code: Electric panel  $\leq$  X Amps**
  - 100% enforceable by unsophisticated official
  - Inspection requires 15 seconds
  - Builder's interest shifts from compliance to design (else the house won't work and the occupants will be unhappy)
  - Effectively and predictably reduces peak load as well
  - Leaves open all efficiency options
- **Reality**
  - Need to limit several capacities (furnace, A/C, others?)
  - Might discourage certain control options
  - Probably need to be paired with some traditional requirements

## Issue: Equipment Efficiency, cont'd.

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- **2009 IECC disallows equipment trade-offs—why?**
  - “Why” is not a valid question in the ICC’s process
  - However the major arguments are fairly clear...
    - Equipment efficiency is legally outside the scope of the IECC
      - If the code can’t regulate it, the code shouldn’t give credit for it
      - NAECA minimums haven’t kept up with typical practice
      - So, equipment efficiency is a “free rider” bypass
    - Energy saved by high-efficiency equipment is short-lived
      - ~15-20 years versus 30-100 years for envelope
      - Replacement equipment not likely to be influenced by initial equipment
      - So, trading envelope for HVAC efficiency is a net loser
    - Comfort of good envelope is generally better, may induce lower heating and higher cooling setpoints

